PhD Course:
Advanced Energy Systems Analysis on the EnergyPLAN Model

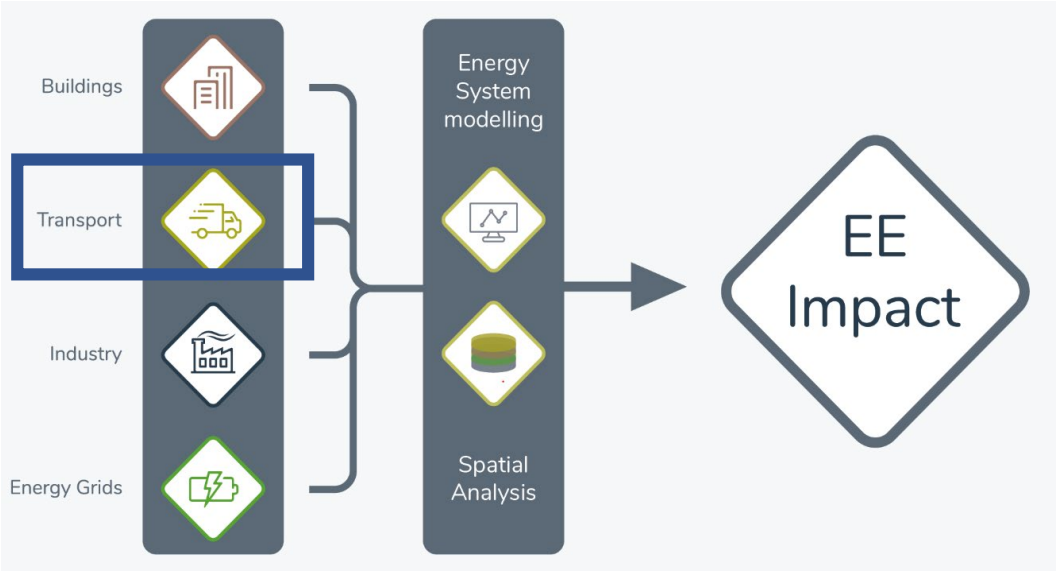
Danish Case: Transport Sector

Hamza Abid

Introduction

sEEnergies

“Quantification of synergies between energy efficiency first principle and renewable energy systems for 2050 decarbonization”



Introduction

Reference Year: 2020

DEA Energy and Climate Outlook 2018

Existing Scenarios

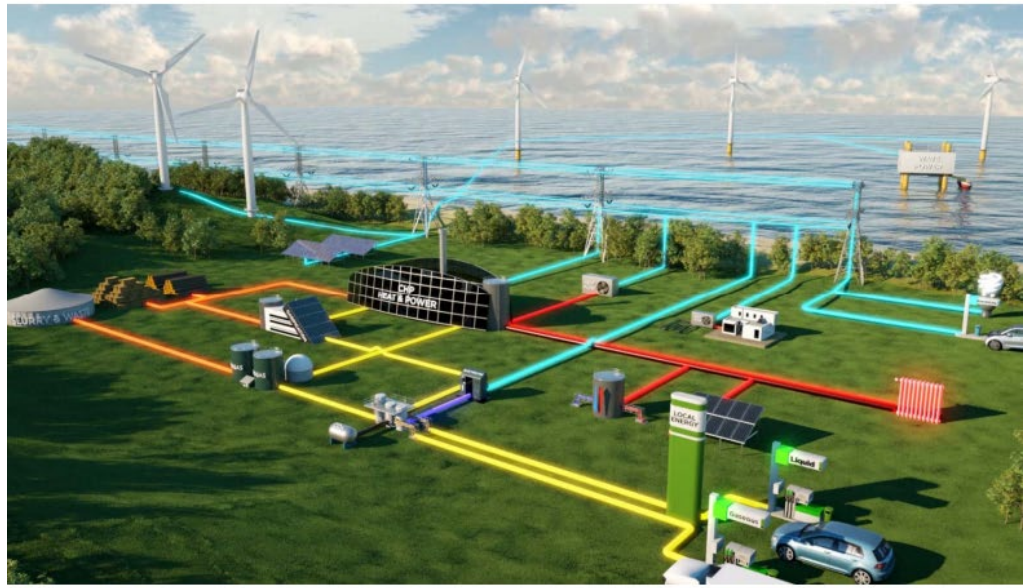
IDA Energy Vision 2050

DEA Wind 2050

DEA Fossil 2050

The Danish Society of Engineers, IDA

a modern professional association for technical and science professionals



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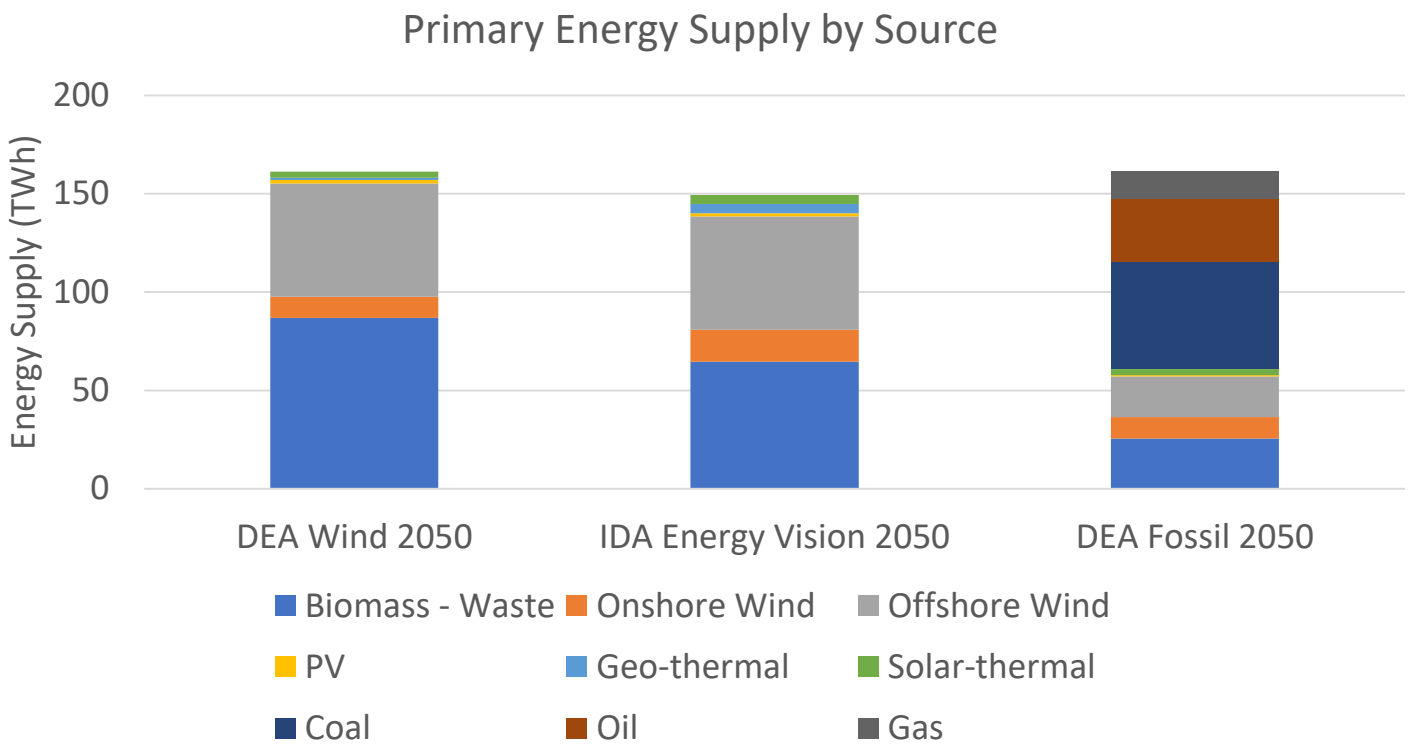
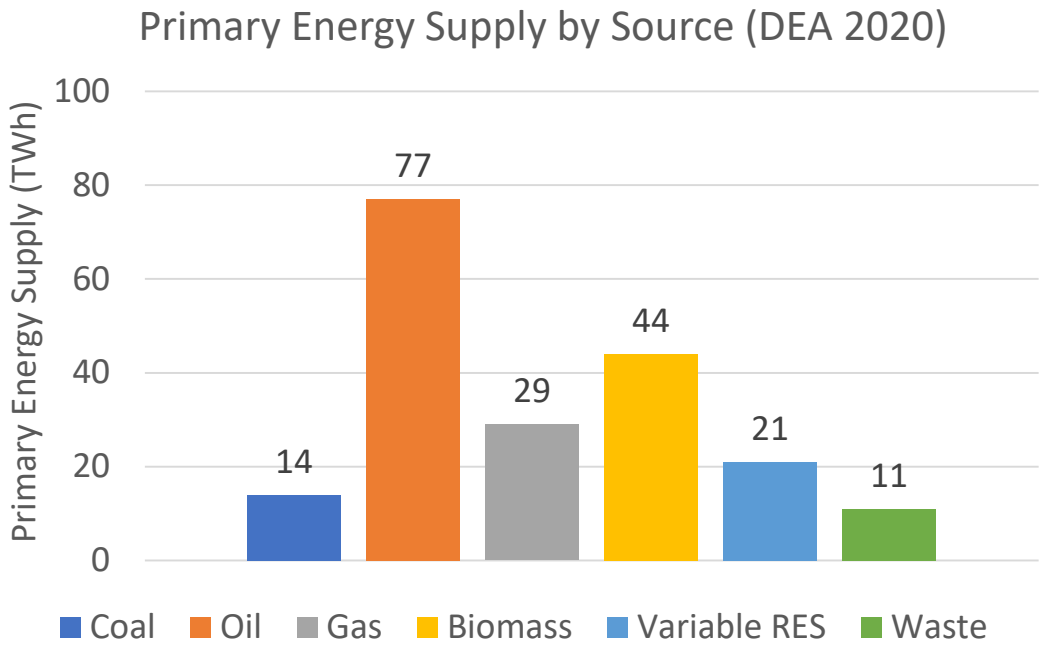
DENMARK

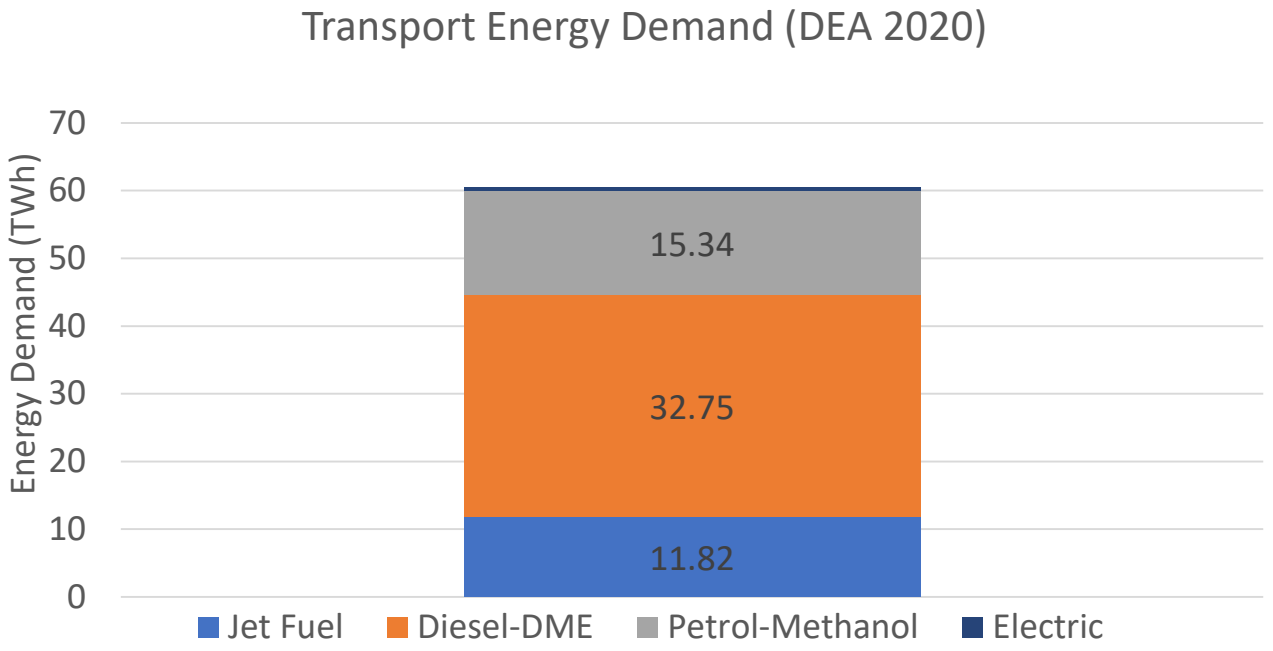
Denmark 2050 Scenarios



Source: IDA Energy Vision, Technical Data and Methods Report 2015

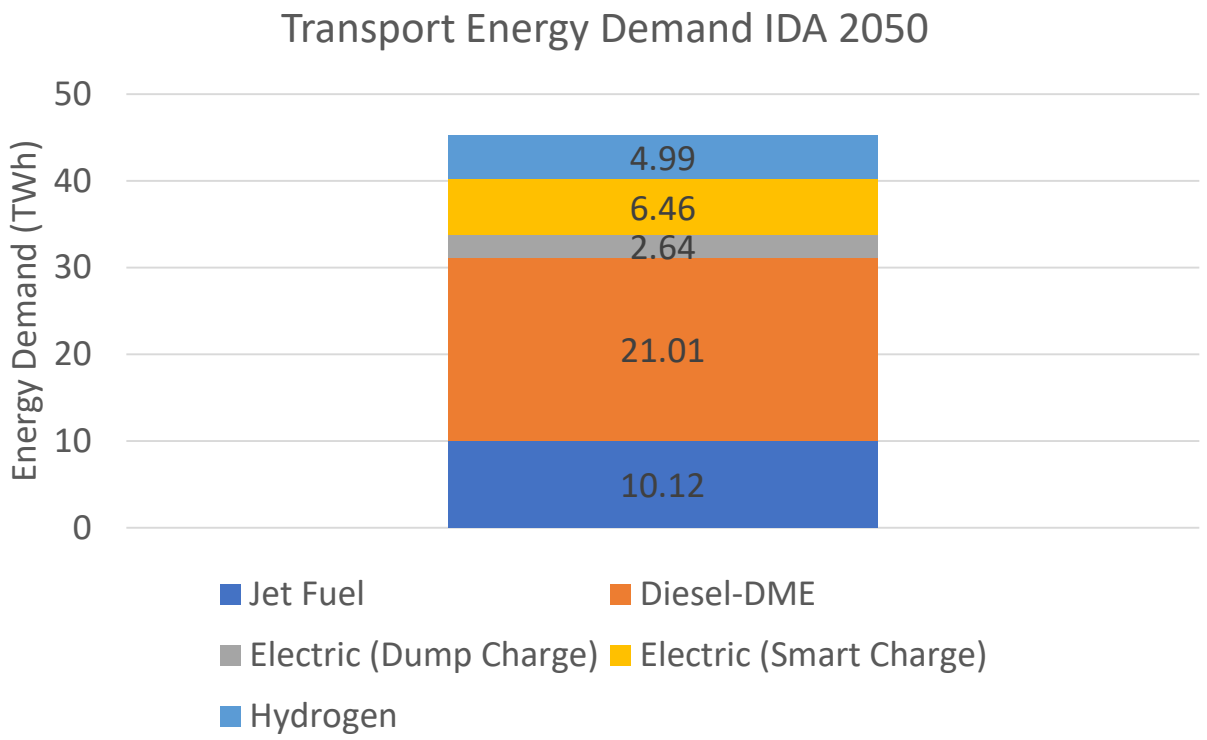
Denmark Energy and Climate Outlook 2018

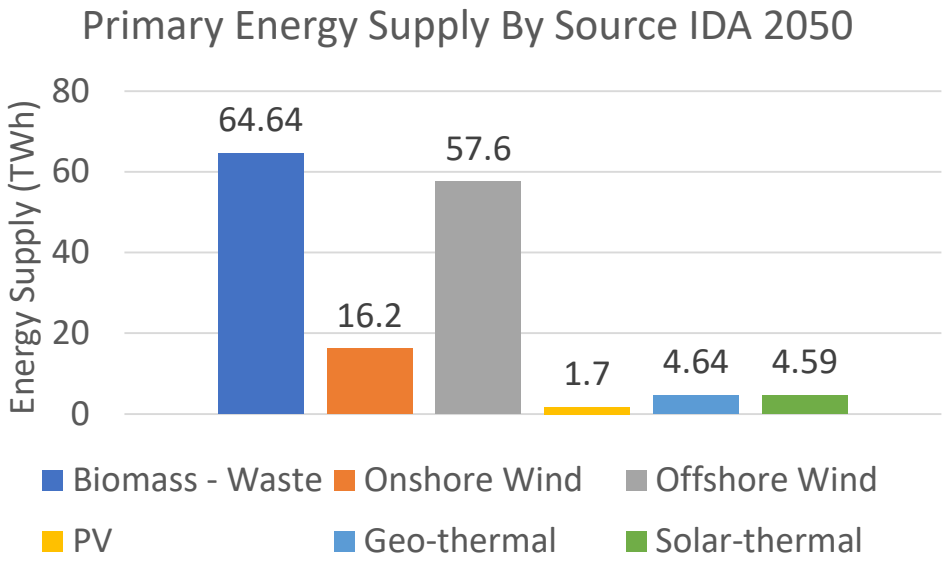




Source: DEA Climate Outlook 2018

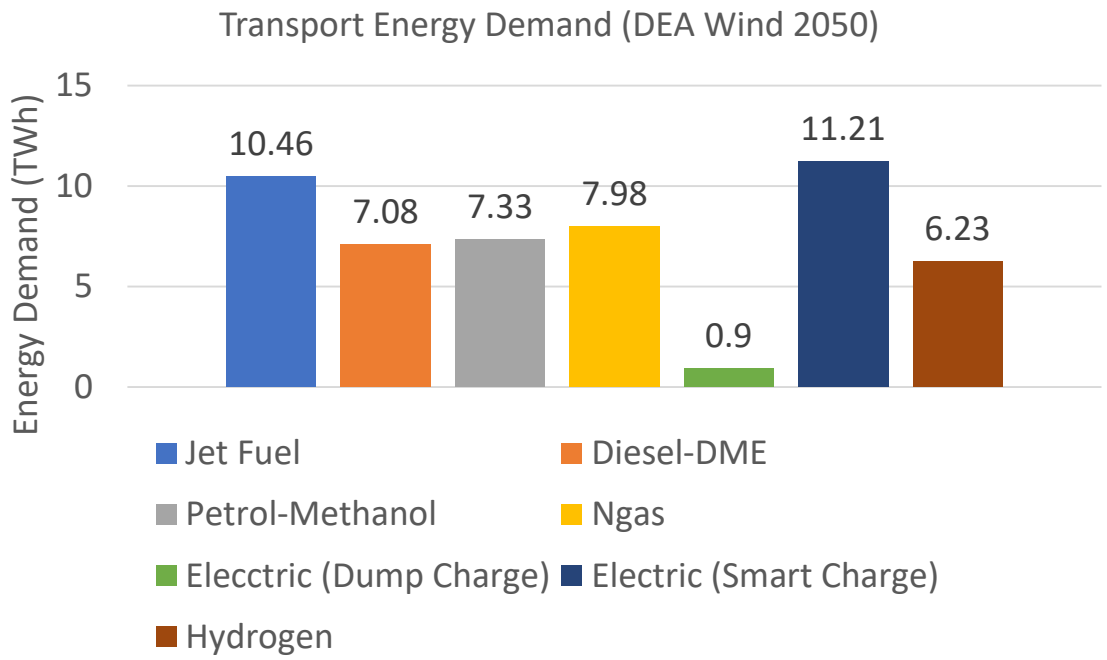
Denmark IDA Energy Vision 2050

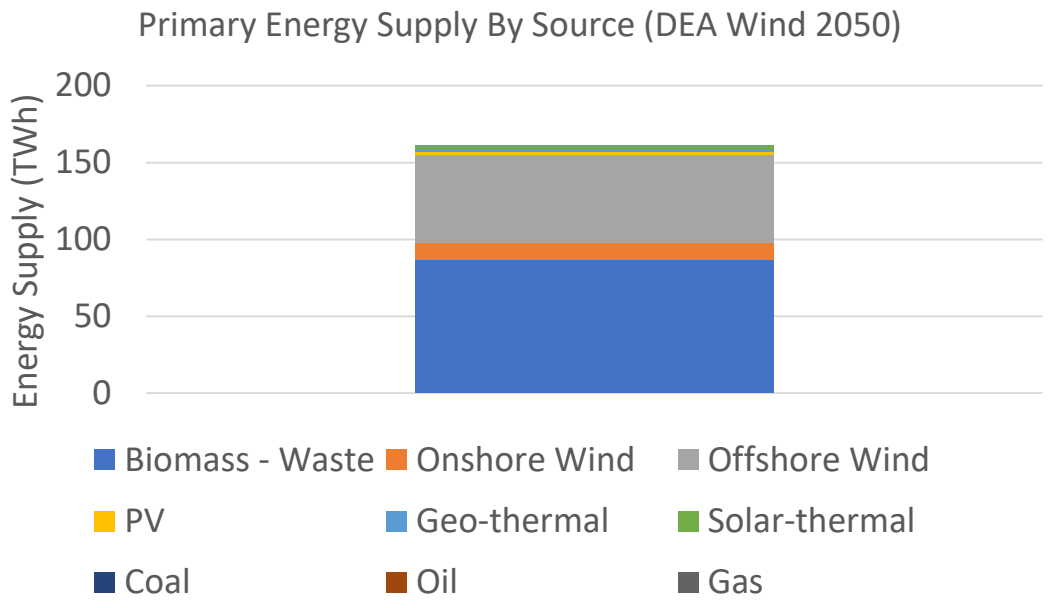




Source: IDA Energy Vision, Technical Data and Methods Report 2015

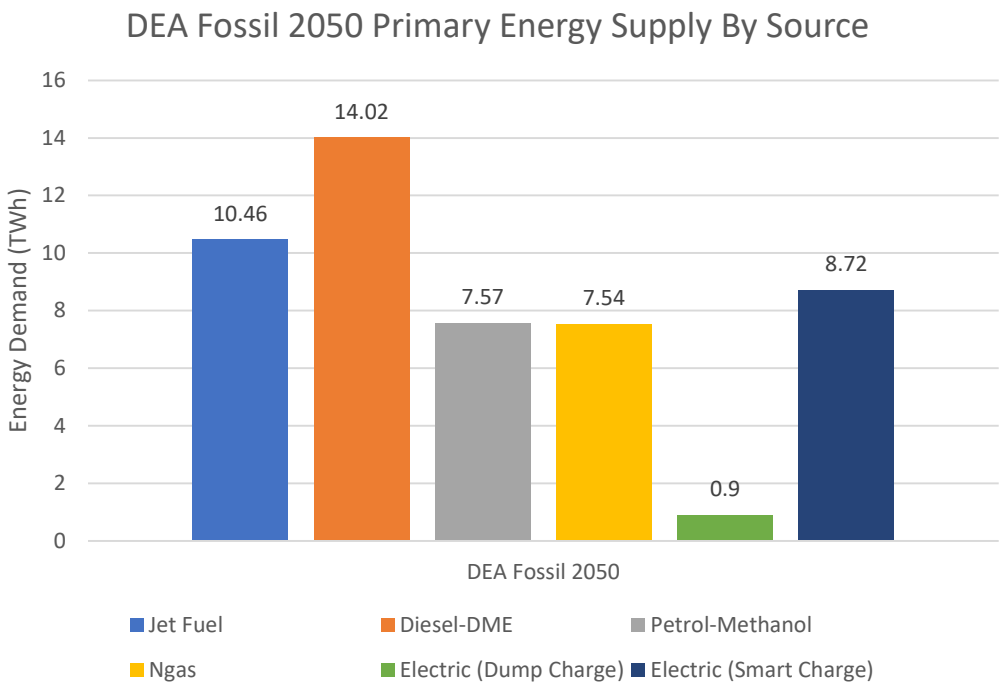
Denmark DEA Wind 2050

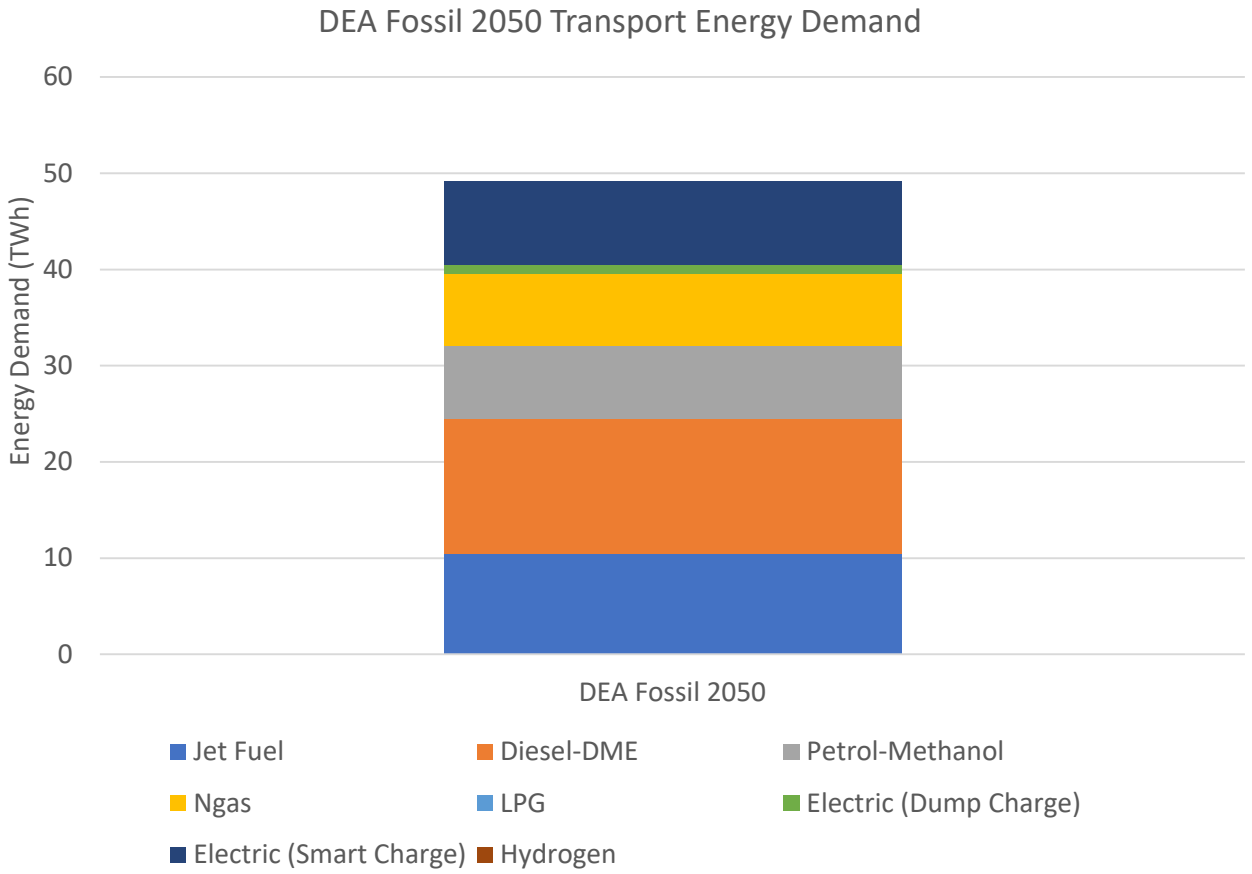




Source: IDA Energy Vision, Technical Data and Methods Report 2015

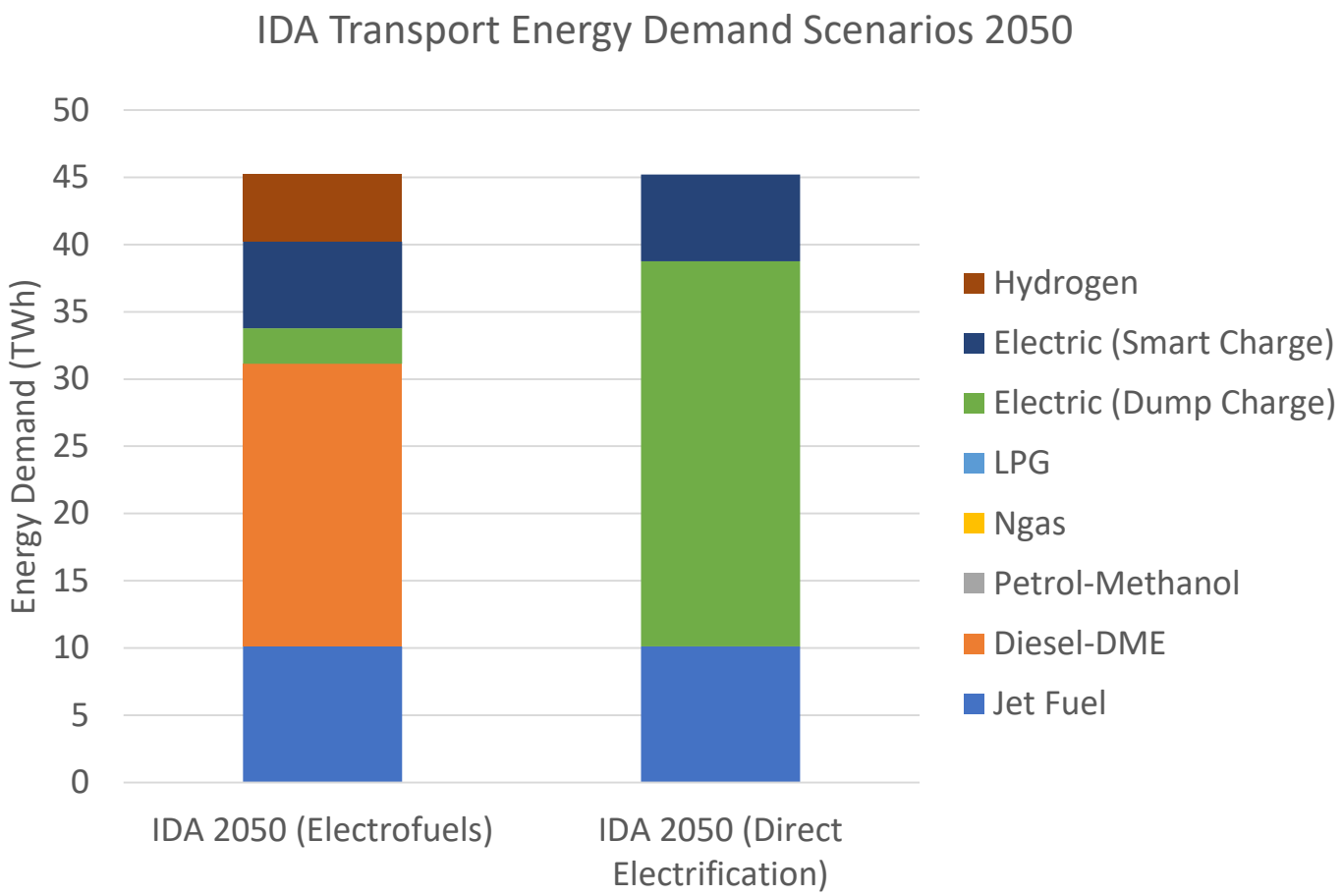
Denmark DEA Fossil 2050





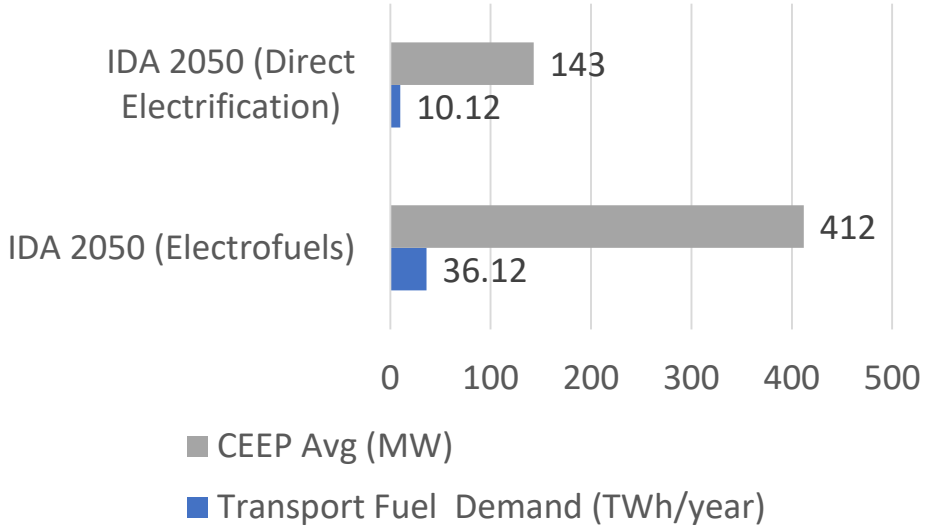
Source: IDA Energy Vision, Technical Data and Methods Report 2015

IDA 2050: Transport Electrification

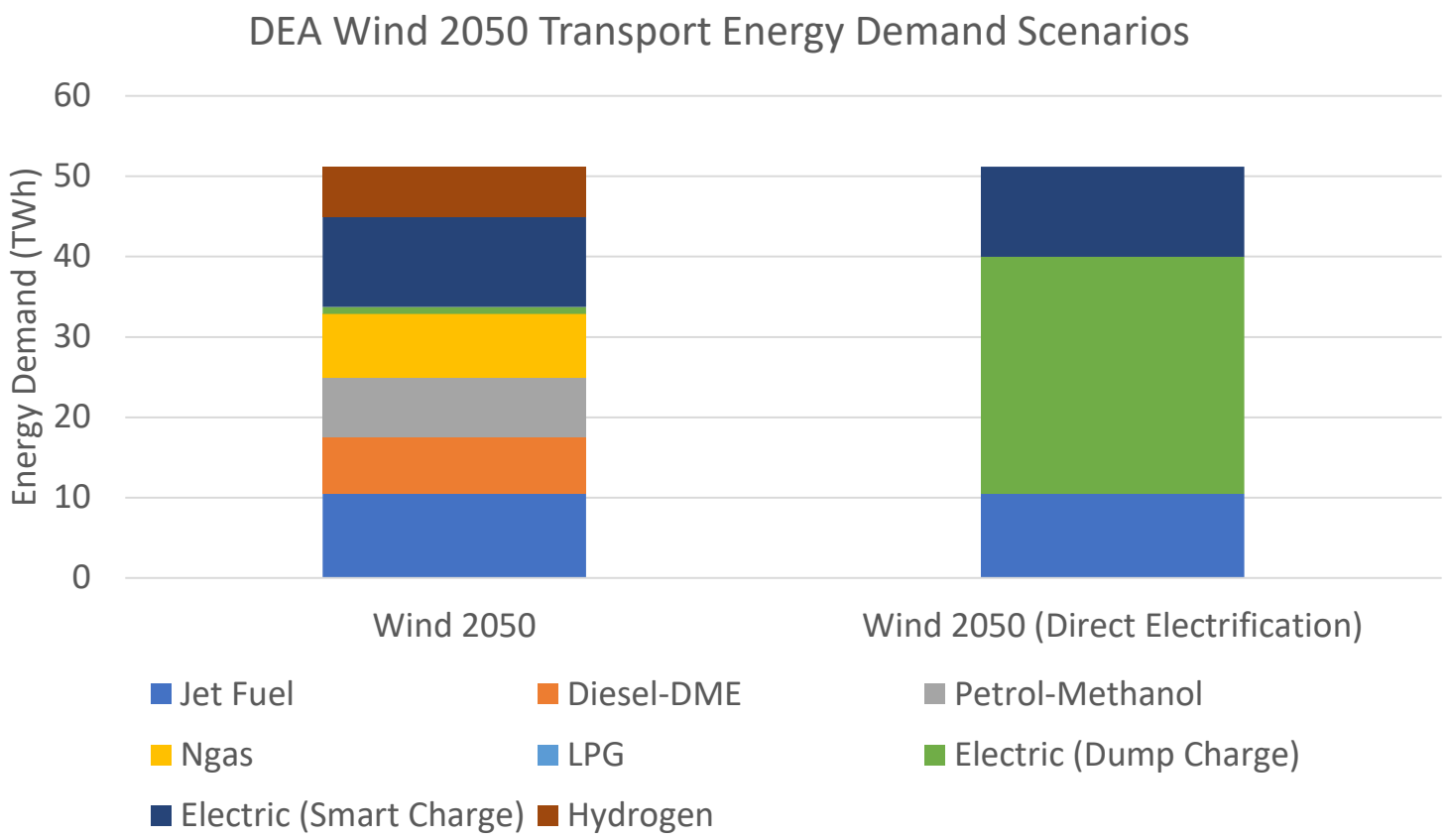


IDA 2050: Transport Electrification Results

	Transport Fuel Demand (TWh/year)	CEEP Avg (MW)	CO2 (Mt)
IDA 2050 (Electrofuels)	36.12	412	-7.6
IDA 2050 (Direct Electrification)	10.12	143	-2.63



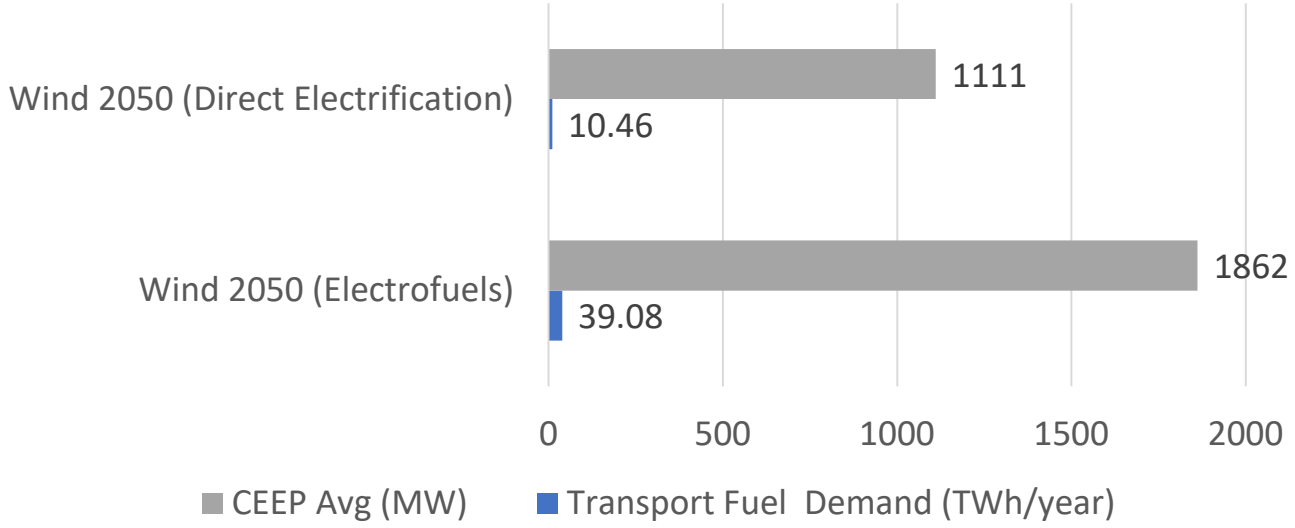
DEA Wind 2050: Transport Electrification



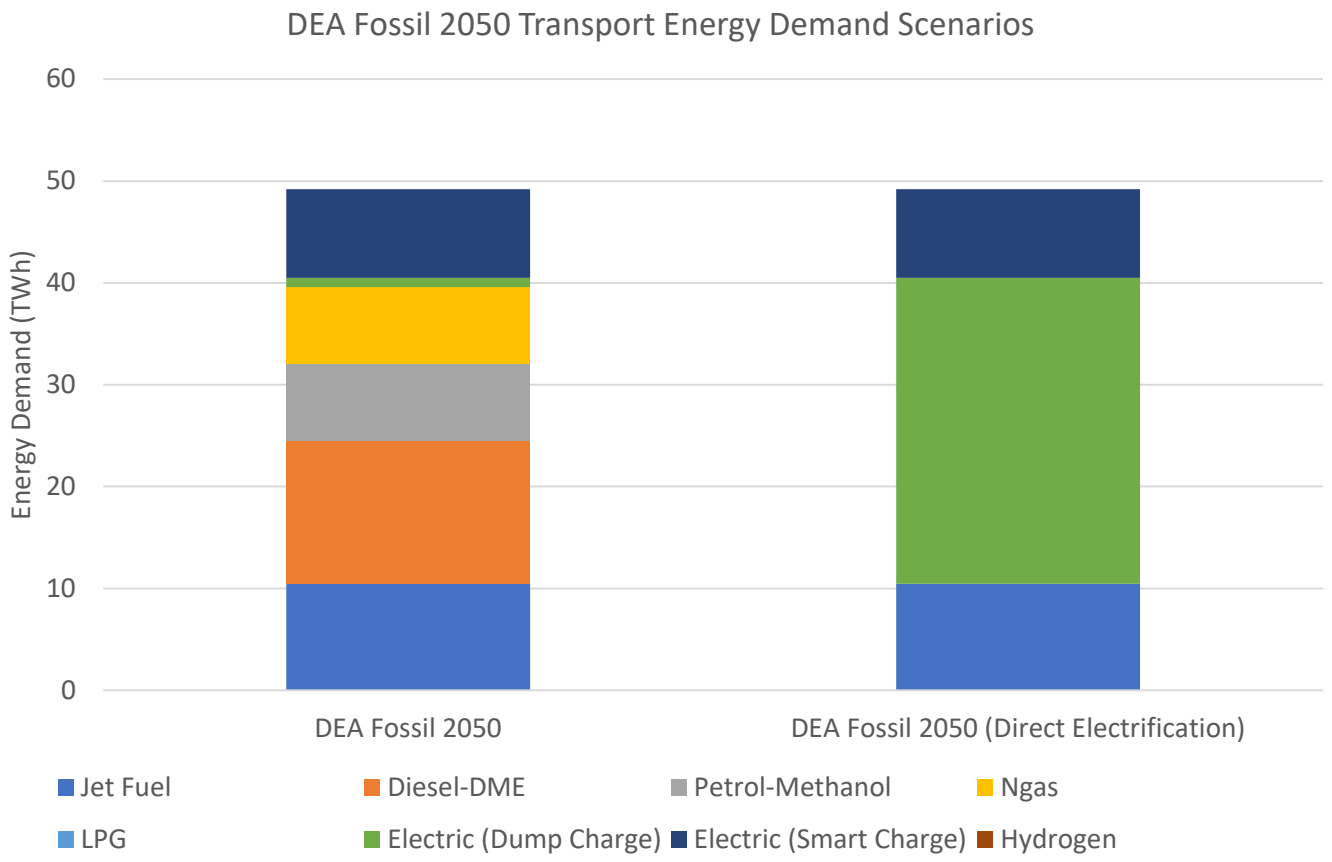
Source: IDA Energy Vision, Technical Data and Methods Report 2015

DEA Wind 2050: Transport Electrification Results

	Transport Fuel Demand (TWh/year)	CEEP Avg (MW)	CO2 (Mt)
Wind 2050 (Electro fuels)	39.08	1862	-5.72
Wind 2050 (Direct Electrification)	10.46	1111	-5.25



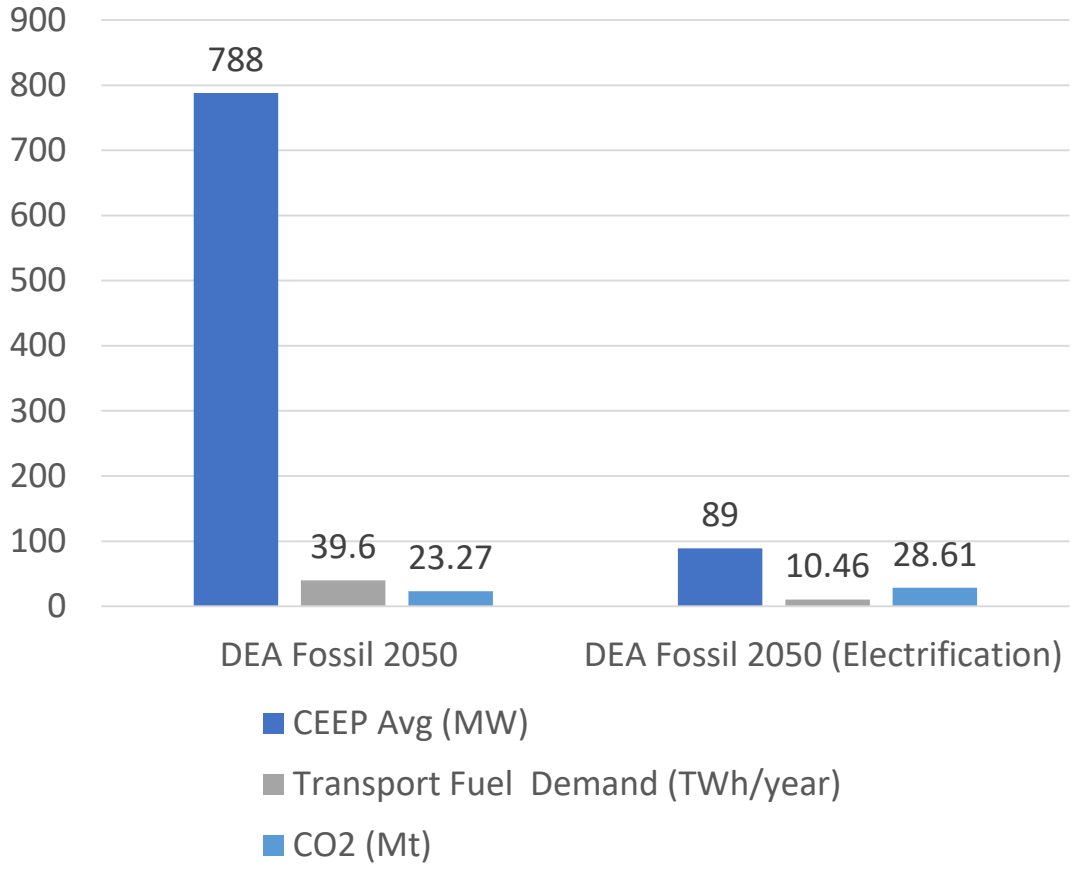
DEA Fossil 2050: Transport Electrification



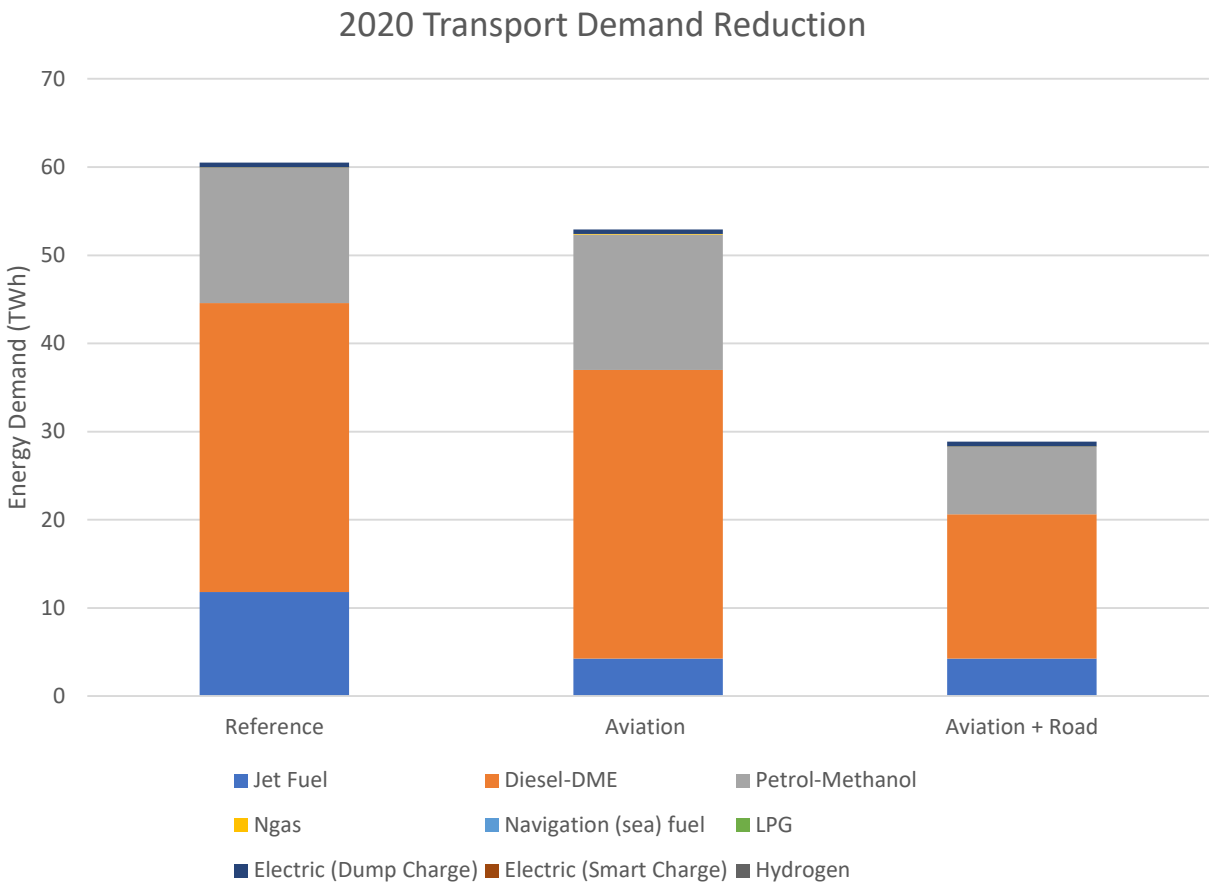
Source: IDA Energy Vision, Technical Data and Methods Report 2015

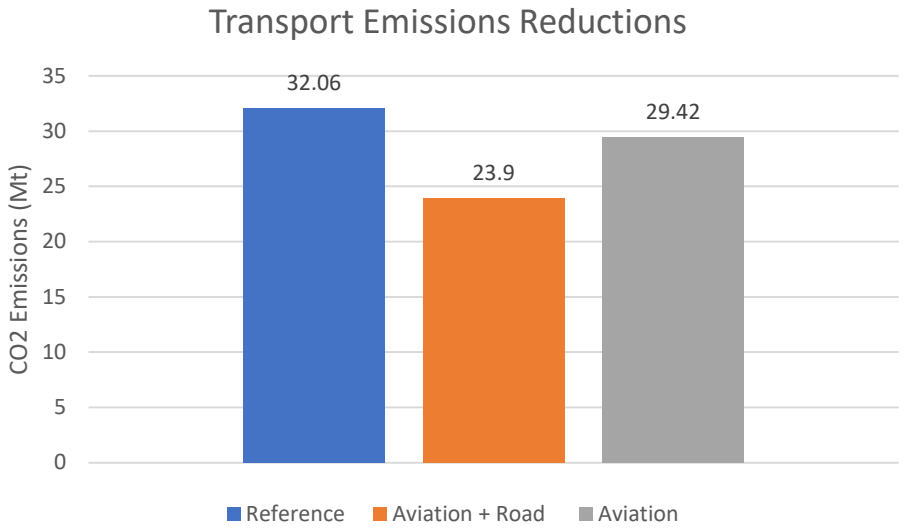
DEA Fossil 2050: Transport Electrification Results

	CEEP Avg (MW)	Transport Fuel Demand (TWh/year)	CO2 (Mt)
DEA Fossil 2050	788	39.6	23.27
DEA Fossil 2050 (Electrification)	89	10.46	28.61



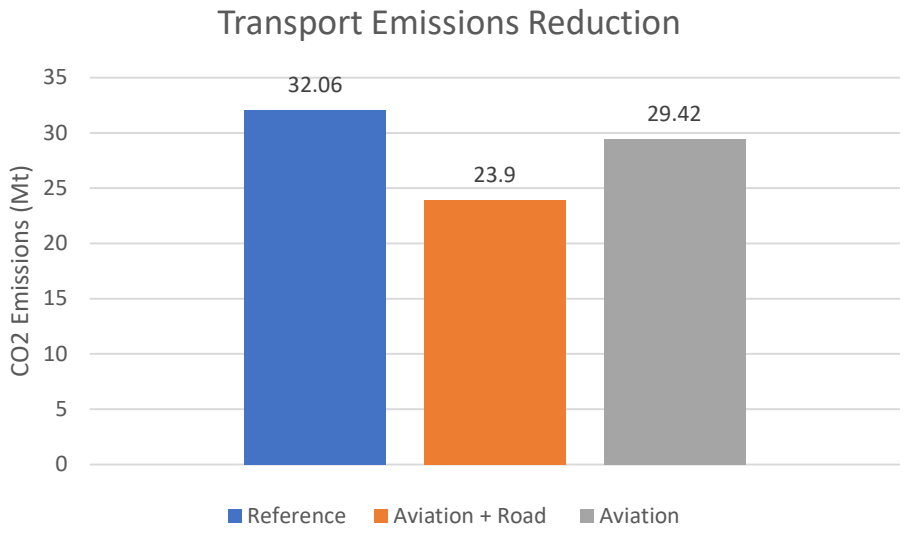
Impact of Covid-19 on Danish Transport Emissions: 2020





2020: Impact of Covid-19 on Transport Emissions

	CO2 emissions Net (Mt)	Total Annual Costs (Million Euro)	Transport Fuel Demand (TWh/year)
Reference	32.06	18815	60.5
Aviation + Road	23.9	17044	28.27
Aviation	29.42	18479	52.35
Reduction - Aviation + Road	**25%**	**9%**	**53%**
Reduction - Aviation	**8%**	**2%**	**13%**



Thank You ☺